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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
JANKUS, ALMIS R	

ART UNIT	PAPER NUMBER
2671	12

DATE MAILED: 06/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/852,808	VLACHOS ET AL.	
	Examiner	Art Unit	
	Almis R Jankus	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *11-47* is/are allowed.

6)☒ Claim(s) *1,48 and 49* is/are rejected.

7)☒ Claim(s) *2-10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-49 are presented for examination.

2. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Kato.

With respect to claim 1, Kato teaches the claimed method for generating a cubic Bezier triangular control mesh corresponding to a triangular primitive, at the abstract with the teaching of "A control mesh of polygonal approximations is generated from one of a variety of conventional object representation schemes" and "If the polygons being generated are triangles, Bezier triangles are used in place of the original triangles to provide a surface rendering that has a greater level of control."

At this point it is important to understand the differences in terminology used at Kato and the instant specification. A table is provided below for easier comparison.

Term	As used at claim 1	As used at Kato
parameter	"... the vertex parameters for each vertex includes three-dimensional coordinates and a normal vector;"	at column 3 lines 6-7, "FIG.9 is an illustration of generating 10 Bezier control parameters from 3 edge splines" at column 7 lines 27-29, "As is known, there are 10 surface parameters (called control points) required to create a bicubic Bezier patch"

Claim 1 requires the vertex parameters for each vertex to include three-dimensional

coordinates and a normal vector. This corresponds to the teaching at Kato, at the abstract that the parameters (control points) for the Bezier triangles are calculated from the known vertices of the triangles, and the reconstruction data; the reconstruction data including surface normal data (also at the abstract). Therefore, Kato teaches the requirement at claim 1 of receiving vertex parameters corresponding to three vertices of the triangular primitive, wherein the vertex parameters for each vertex includes three-dimensional coordinates and a normal vector. It is to be noted that the claimed requirement for a vertex parameter is that of including the coordinates and a normal vector, not comprising coordinates and normal vector. Kato clearly teaches including the coordinates and normal vectors. Kato may further teach using tangent vectors which are based on normal vectors, but this in no way teaches away from what is broadly claimed. The instant limitation of calculating two control points corresponding to each edge of three edges of the triangular primitive based on the vertex parameters of vertices that define the edge is shown at figure 9 at Kato. Calculating a central control point using the vertex parameters for each of the three vertices and the control points corresponding to the three edges, is taught at figure 9.

3. Claims 2-10 stand objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. Claims 11-47 stand allowed.

5. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 2, the prior art of record does not fairly teach "mapping a segment equal to a fraction of a length of the edge to a first plane defined by a first normal corresponding to a first vertex of the vertices that define the edge, wherein the segment is mapped such that the segment is coplanar with the edge and the first normal, wherein a first end of the segment as mapped corresponds to the first vertex and wherein a second end of the segment as mapped defines a first control point corresponding to the edge;

and mapping the segment to a second plane defined by a second normal corresponding to a second vertex of the vertices that define the edge, wherein the segment is mapped such that the segment is coplanar with the edge and the second normal, wherein a first end of the segment as mapped corresponds to the second vertex and wherein a second end of the segment as mapped defines a second control point corresponding to the edge";

With respect to claim 6 the prior art of record does not fairly teach the claimed "projecting a second vertex of the vertices that define the edge into a first plane defined by a first normal corresponding to a first vertex of the vertices that define the edge to produce a first reference segment corresponding to the edge, wherein projecting the

second vertex is performed in a direction parallel to the first normal, wherein a fraction of the first reference segment defines a first control point corresponding to the edge;

and projecting the first vertex into a second plane defined by a second normal corresponding to the second vertex to produce a second reference segment corresponding to the edge, wherein projecting the first vertex is performed in a direction parallel to the second normal, wherein a fraction of the second reference segment defines a second control point corresponding to the edge";

With respect to claim 8 the prior art of record does not fairly teach the claimed "reflecting each of the three vertices through a line defined by a pair of the control points to produce a reflected point, wherein each control point of the pair of control points for reflection of a particular vertex is determined using a plane defined by the normal corresponding to the particular vertex, wherein the reflected point is defined by a set of three-dimensional coordinates;

averaging the three-dimensional coordinates of the reflected points produced by reflecting the three vertices to produce coordinates corresponding to the central control point";

With respect to claim 9 the prior art of record does not fairly teach the claimed "determining each coordinate value for the central control point by:

adding corresponding coordinate values of the control points for each of the edges to produce a first sum;

adding corresponding coordinate values for the three vertices to produce a second sum;

dividing the first sum by four to produce a first value;

dividing the second sum by six to produce a second value;

and subtracting the second value from the first value";

With respect to claim 10 the prior art of record does not fairly teach the claimed "combining at least a portion of the vertex parameters of the three vertices and parameters for the control points corresponding to the edges based on a user-specified combining parameters";

With respect to claim 11 the prior art of record does not fairly teach the claimed "generating a plurality of planar triangle primitives using the cubic Bezier triangular control mesh, wherein the plurality of planar triangle primitives approximate the non-planar surface in three dimensions" as a third step after the known steps of "receiving vertex parameters corresponding to three vertices of a triangular primitive that represents the non-planar surface, wherein the vertex parameters for each vertex include three-dimensional coordinates and a normal vector;

calculating a set of control points corresponding to the triangle primitive based on the three vertices, wherein the set of control points and the vertices define a cubic Bezier triangular control mesh";

With respect to claim 33 the prior art of record does not fairly teach the claimed "a tessellation block operably coupled to the control point generation block, wherein the tessellation block tessellates the higher-order graphics primitive to produce a plurality of planar triangle primitives;

and a three-dimensional graphics pipeline operably coupled to the tessellation block, wherein the three-dimensional graphics pipeline processes the plurality of planar triangle primitives to produce pixel data".

6. Claims 48-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999). The term "scalar" in claim 48 is used by the claim to mean "control point", while the accepted meaning is "a quantity that is completely specified by a single number" The term is indefinite because the specification does not clearly redefine the term. A control point in three-dimensional space requires three numbers to locate its position, thus, a control point cannot be expressed as a scalar.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Almis R Jankus whose telephone number is 703-305-9795. The examiner can normally be reached on M-F, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman can be reached on 703-305-9798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJ

ALMIS R. JANKUS
PRIMARY EXAMINER